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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,165	11/26/2003	Ulrich C. Boettiger	M4065.0948/P948	5534
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DICKSTEIN SHAPIRO LLP 1825 EYE STREET, NW WASHINGTON, DC 20006			EXAMINER DINH, JACK	
			ART UNIT 2873	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/721,165	<b>Applicant(s)</b> BOETTIGER ET AL.	
	<b>Examiner</b> Jack Dinh	<b>Art Unit</b> 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>0307</u> . | 6) <input checked="" type="checkbox"/> Other: <u>DETAILED ACTION</u> .                  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 5, the phrase “the opening is shaped such that said lens material accounts for color dependent photon absorption differences” renders the claims indefinite. It is unclear of the geometric configuration of the recessed area being claimed in order to account for color dependent photon absorption differences. No where in the specification clearly described such shape associates with photon absorption.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 1, 2 and 6 are rejected under 35 U.S.C. 102(e) as being unpatentable by Ozawa (US Patent 6,781,762).

Regarding claim 1, Ozawa (figure 11) is interpreted as disclosing a microlens for use in an imager comprising a substrate **210** positioned over a pixel cell, the substrate having a bottom surface facing towards the pixel cell and an upper surface opposite the bottom surface, an opening in the substrate recessed from the upper surface of the substrate, and lens material **500** located within the opening of the substrate, the opening serving as a mold for the lens material (see figure).

Regarding claim 2, Ozawa (figure 11) is interpreted as further disclosing that the opening has at least one arcuate portion (see figure).

Regarding claim 6, Ozawa (figure 11) is interpreted as further disclosing that the lens material exhibits a refractive index greater than that of the substrate (see figure).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US Patent 6,781,762), as applied in claim 1, in view of Nishihara (US Patent 5,764,319).

Regarding claim 3, Ozawa is interpreted as disclosing all the claimed limitations as described above except that the opening is shaped such that lens material corrects for optical aberrations. Within the same field of endeavor, Nishihara is interpreted as disclosing that the microlens can be formed in aspheric shape so as to correct aberrations. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the microlens in aspheric shape for the purpose of correcting optical aberrations.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US Patent 6,781,762), as applied in claim 1, in view of Kravitz (US Patent 5,790,730).

Regarding claim 4, Ozawa is interpreted as disclosing all the claimed limitations as described above except that the substrate comprises silicon dioxide. Within the same field of endeavor, Kravitz is interpreted as disclosing that silicon dioxide substrate used with microlens is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the substrate from silicon dioxide for the purpose of selecting a desired refractive index for the substrate.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US Patent 6,781,762), as applied in claim 1.

Regarding claim 7, Ozawa is interpreted as disclosing all the claimed limitations as described above except that the lens material exhibits a refractive index less than the substrate.

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However Ozawa discloses that the lens material exhibits a refractive index greater than that of the substrate (see figure 11). Whether the lens material has a refractive index higher or lower than the substrate will cause the beam to converge or diverge, which is clearly depending on specific application. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the lens material with a lower refractive index than the substrate for application specific purpose.

6. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable by Ozawa (US Patent 6,781,762), in view of Kravitz (US Patent 5,790,730), and further in view of Nishihara (US Patent 5,764,319).

Regarding claim 8, Ozawa (figure 11) is interpreted as disclosing a microlens comprising a substrate **210** positioned over a pixel cell, the substrate having a bottom surface facing towards the pixel cell and an upper surface opposite the bottom surface, an opening in the substrate recessed from the upper surface of the substrate, and lens material **500** located within the opening of the substrate. Ozawa is interpreted as disclosing all the claimed limitations as described above except that the substrate comprises silicon dioxide. Within the same field of endeavor, Kravitz is interpreted as disclosing that silicon dioxide substrate used with microlens is well known in the art. Ozawa in view of Kravitz discloses all the claimed limitations except that the opening is shaped such the lens material corrects for optical aberrations. Within the same field of endeavor, Nishihara is interpreted as disclosing that the microlens can be formed in aspheric shape so as to correct aberrations. Therefore, it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to form the substrate from silicon dioxide for the purpose of selecting a desired refractive index for the substrate, and to form the microlens in aspheric shape for the purpose of correcting optical aberrations.

Regarding claim 9, Ozawa (figure 15) is interpreted as further disclosing that the opening is structured such that a focal point of the micro-lens is associated with a color of light (col. 8, lines 60-65).

Regarding claim 10, Ozawa (figure 11) is interpreted as further disclosing that the lens material exhibits a refractive index greater than that of the substrate (see figure).

Regarding claim 11, Ozawa in view of Kravitz and further in view of Nishihara is interpreted as disclosing all the claimed limitations as described above except that the lens material exhibits a refractive index less than the substrate. However Ozawa (figure 11) discloses that the lens material exhibits a refractive index greater than that of the substrate. Whether the lens material has a refractive index higher or lower than the substrate will cause the beam to converge or diverge, which is clearly depending on specific application. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the lens material with a lower refractive index than the substrate for application specific purpose.

***Response to Arguments***

7. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L. Mack, can be reached at 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jack Dinh  
05/21/07

  
RICKY MACK  
SUPERVISORY PATENT EXAMINER